2005 URBAN WATER MANAGEMENT PLAN

FOR

CITY OF SAN JOSE
MUNICIPAL WATER SYSTEM

ENVIRONMENTAL SERVICES DEPARTMENT

DECEMBER 2005

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ABBREVIATIONS

AB	Assembly Bill
ABAG	Association of Bay Area Governments
af	Acre-feet
af/yr	Acre-feet per year
BARWRP	Bay Area Regional Water Recycling Program
BAWSCA	Bay Area Water Supply and Conservation Agency
bg	Billion gallons
BMP	Best Management Practice
CEQA	California Environmental Quality Act
CII	Commercial/Industrial/Institutional
CIP	Capital Improvement Program
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
DHS	California Department of Health Services
DMM	Demand Management Measures
DWR	Department of Water Resources
gpm	Gallons per minute
HCF	Hundred cubic feet (748 gallons)
IWRP	Integrated Water Resources Plan
IWSAP	Interim Water Shortage Allocation Plan
MG	Million gallons
mgd	Million gallons per day
MOU	Memorandum of Understanding
NPDES	National Pollution Discharge Elimination System
PEIR	Program Environmental Impact Report
P.S.	Pump station
psi	Pounds per square inch
SB	Senate Bill
SBWR	South Bay Water Recycling
SCVWD	Santa Clara Valley Water District
SFPUC	San Francisco Water Department/Public Utilities Commission
SJMWS	San Jose Municipal Water System
SWP	State Water Project
UWMP	Urban Water Management Plan
WEP	Water Efficiency Program
WPCP	San Jose/Santa Clara Water Pollution Control Plant
WSIP	Water System Improvement Program

1
Introduction

The 1983 California Urban Water Management Act (Act), also referred to as Assembly Bill 797 (Appendix A), requires all urban water suppliers who directly serve 3,000 or more customers or who provide 3,000 or more acre feet of water per year to prepare an Urban Water Management Plan (Plan). The purpose of the Act is to ensure that water suppliers plan for the long-term conservation and efficient use of the State's limited urban water supplies. The City of San Jose submitted its first Plan in 1985 in compliance with the Act. Updates to the Plan are required every five years. The City prepared updates to the Plan in 1990,1995 and 2000.

Several amendments to the Act since the last update in 2000 have changed the requirements for the 2005 Plan Update. New and/or revised requirements address topics such as groundwater, supply management, water quality, use of recycled water and revised submittal procedures. Two notable bills have added new requirements to the Act, commonly referred to as SB 610 and SB 221. These bills are intended to improve the link between water supply availability and certain land use decisions made by cities and counties. They focus on comprehensive water policies and the coordination of local water supply and land use decisions to help provide California's cities, farms and rural communities with adequate water supplies. SB 610 and SB 221 require that counties and cities consider the availability of adequate water supplies for certain new large developments and UWMPs are identified as key source documents for this verification.

The sources of imported water supply are beyond the control of local jurisdictions within the County. To reduce the need for imported water and to maximize the efficient use of the local supply, San Jose has worked with Santa Clara Valley Water District (SCVWD) to conserve water. Many methods are being practiced by the City to maximize our water resources while minimizing the need to import supplies. San Jose has demonstrated its commitment to water conservation with the many programs that have been implemented and by the recognition that water conservation is a permanent and ongoing activity. Through its conservation activities, the City has managed to reduce demand and increase water supply reliability. By supplying the City's customers with water supplies from several different sources, the City achieves greater flexibility to monitor each source and ensure that high quality water is being delivered to customers. Additionally, the reuse of treated wastewater through the South Bay Recycling Program has also helped the City to conserve fresh water supplies.

This report examines the City's current and projected water supplies, demands, and sources, and discusses the City's conservation efforts and water shortage plan. Chapter 2 gives a background of the City's water system. Within Chapters 3 and 4 are discussions of water supplies and demands, including a supply/demand comparison through the year 2030. Chapter 5 details the water shortage contingency plan, including the stages of action to be taken during drought years. Chapter 6 gives a discussion of the City's recycled water supplies. Collectively, the report documents the City's planning efforts involved in ensuring a consistent, high quality supply of water to the public.

2
Background

San Jose has a Mediterranean climate averaging 300 days of sunshine annually, with temperature varying from an average of 50 degrees in January to an average of 70 degrees in July and an annual mean precipitation of 14.5 inches. San Jose is the third largest city in California following Los Angeles and San Diego, and it is the 10th largest city in the US.

Three water companies provide drinking water to the City of San Jose: Great Oaks Water Company, San Jose Water Company, and the San Jose Municipal Water System. The first two are private retailers and the Municipal Water System is operated by the City of San Jose. This Plan describes the water supply of the San Jose Municipal Water System.

The City of San Jose Municipal Water System (SJMWS) currently provides water service to approximately 26,500 metered connections. SJMWS services four different areas in the City of San Jose: North San Jose/Alviso, Evergreen, Edenvale, and Coyote. These service areas comprise about 12% of the City's population. (Figure 2-1)

While these service areas represent about 20% of the City's total land area, they contain approximately 58% of the City's developable land. The City's General Plan anticipates significant development within these areas, and population with SJMWS service areas is projected to increase by 45% by the year 2025.

In 1995, the City affirmed its commitment to water conservation by becoming a signatory to the California Urban Water Conservation Council's (CUWCC) Memorandum of Understanding (MOU). The MOU instructs signatories to implement 14 Best Management Practices (BMPs) considered to be cost effective methods for conducting demand management. The City's 2003-2004 Report to the CUWCC documenting its progress in implementing the BMPs is included in this Plan update.

I. NORTH SAN JOSE/ALVISO (Figure 2-2)

The North San Jose/Alviso service area extends from Trimble Road on the south to the Alviso Slough on the north. The area is bordered on the west by the Guadalupe River and on the east by the Coyote Creek.

The North San Jose/Alviso area is served by one completely connected system. The land use is predominantly industrial, with some residential and commercial. The North San Jose/Alviso service area contains 5,600 acres with a 2005 residential population of approximately 15,000. The service area is estimated to be 34% developed (or 88% developed including those areas designated as permanent open space lands). It is expected that this area will be fully developed by 2025.

Figure 2-1. City of San Jose Municipal Water System Boundaries

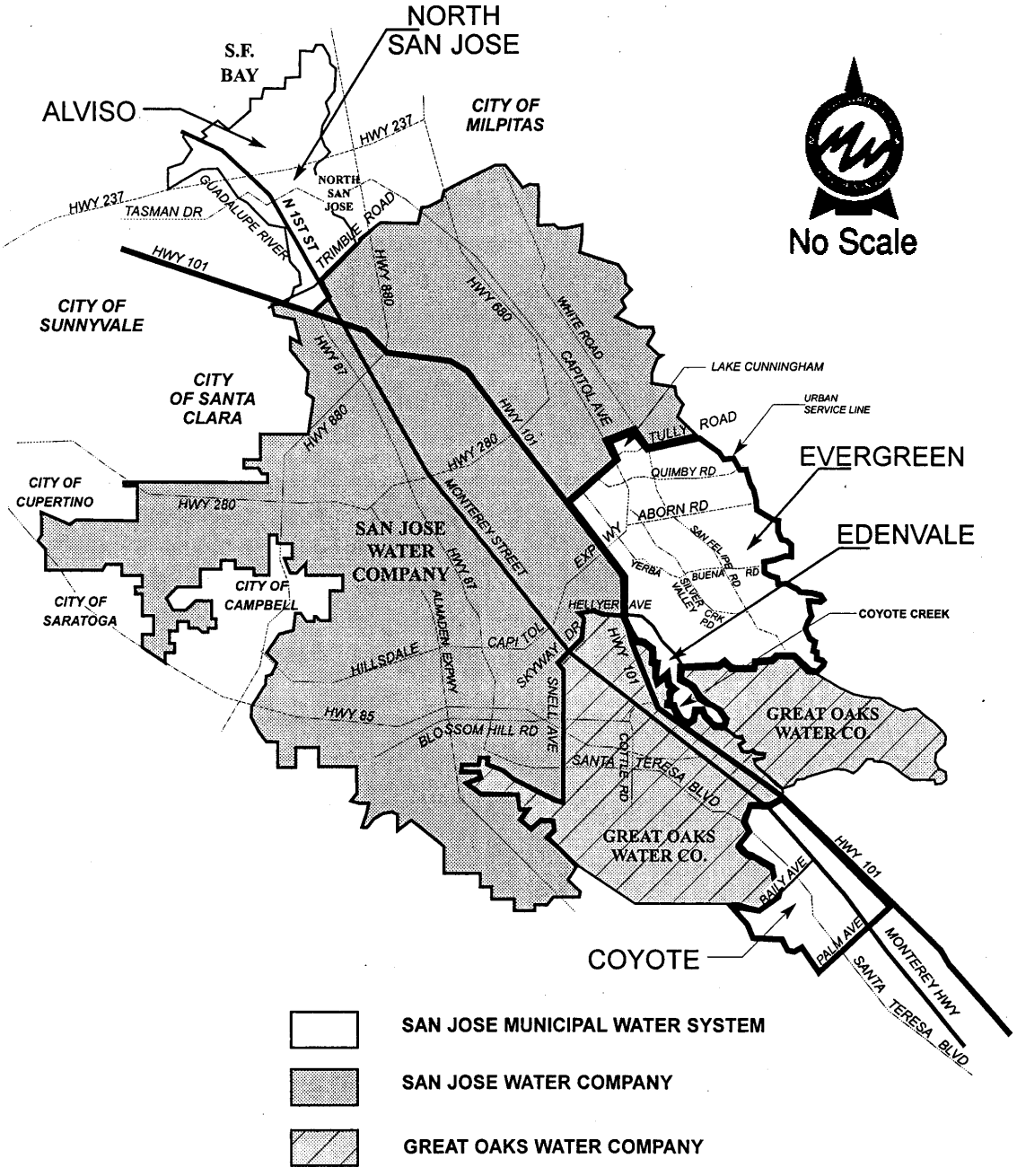
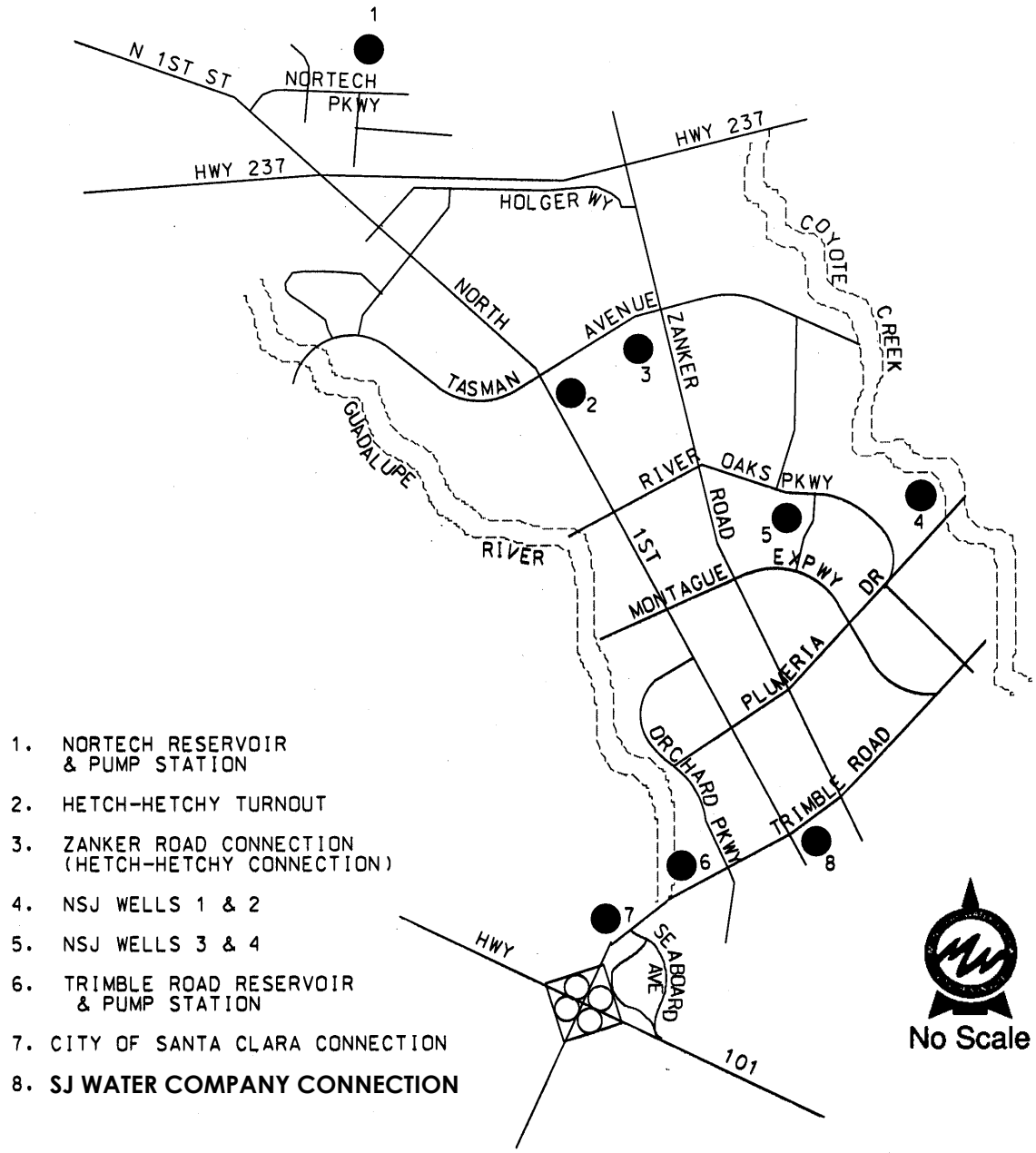


Figure 2-2. North San Jose/Alviso Service Area



II. EVERGREEN (Figure 2-3)

The Evergreen Service Area extends from Highway 101 on the west to the foothills of the Mount Diablo Range on the east. The area is bounded on the north by Tully Road and on the south by the City limits.

The current land use in Evergreen is predominantly residential (94%) and commercial (5%). The service area contains approximately 10,750 acres with a 2005 population of approximately 91,400. The area is estimated to be 72% developed (or 95% developed including those areas designated as permanent open space lands), with projected buildout occurring in 2025. The 2025 projected land use is similar to the current, with uses projected as residential (91%), commercial (5%) and industrial (4%).

III. EDENVALE (Figure 2-4)

The Edenvale service area is located east of Coyote Creek and south of Hellyer Avenue. Covering about 700 acres, Edenvale is zoned for industrial and commercial use and is within the Edenvale Redevelopment Project area. It is currently 36% developed (or 64% developed including areas designated as permanent open space lands) and it is expected to be 100% developed by 2025. Current land use is industrial, with a 2025 projection of 10% commercial and 90% industrial.

IV. COYOTE VALLEY (Figure 2-4)

The Coyote service area is located west of Highway 101, south of Tulare Hill, and north of Palm Avenue. The area includes approximately 7,500 acres and is currently largely undeveloped (not including 51% as permanent open space lands). Full buildout is estimated to occur by 2040, at which time the land use is projected as residential (58%) and industrial (42%).

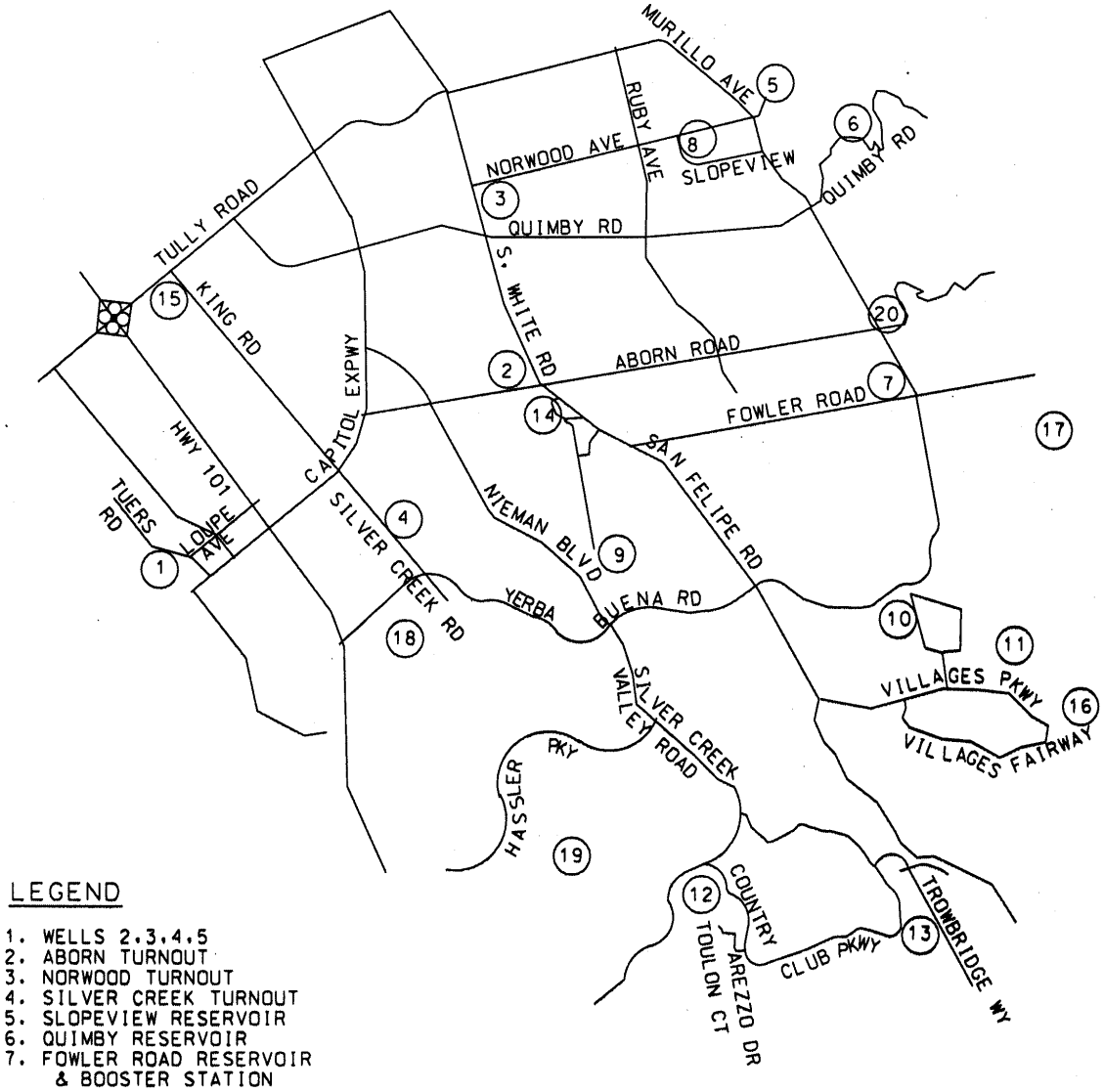
V. DEMOGRAPHICS

Population growth in SJMWS service areas is expected to increase in the next 20 years by approximately 45%, as obtained by ABAG 2003 Census projections (shown in Table 2-1).

Table 2-1. Population Projections for SJMWS's Service Areas

	2005	2010	2015	2020	2025	2030
SJMWS	116,210	130,110	140,330	154,200	167,020	182,410

Figure 2-3. Evergreen Service Area

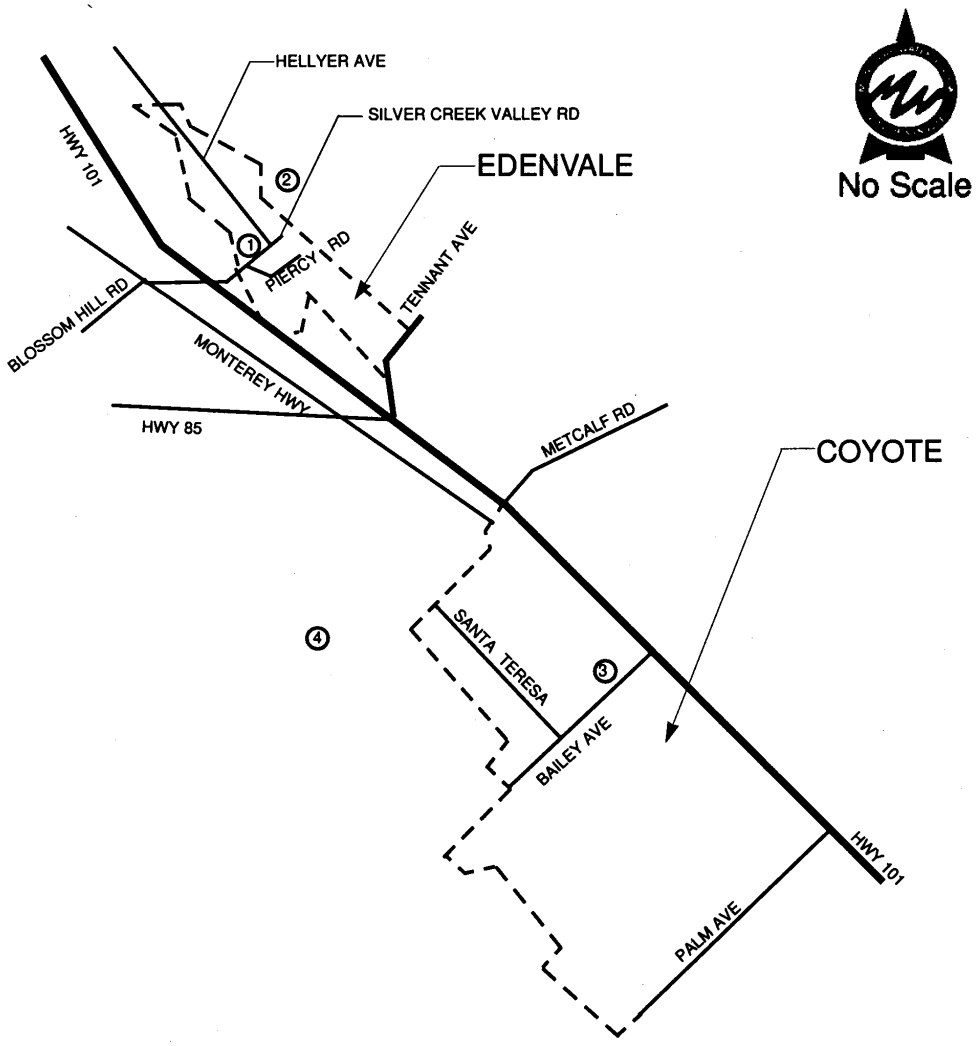


LEGEND

1. WELLS 2,3,4,5
2. ABORN TURNOUT
3. NORWOOD TURNOUT
4. SILVER CREEK TURNOUT
5. SLOPEVIEW RESERVOIR
6. QUIMBY RESERVOIR
7. FOWLER ROAD RESERVOIR & BOOSTER STATION
8. NORWOOD RESERVOIR & BOOSTER STATION
9. CADWALLADER RESERVOIR & BOOSTER STATION
10. VILLA VISTA RESERVOIR & BOOSTER STATION
11. VILLAGES RESERVOIR & BOOSTER STATION
12. TOULON RESERVOIR & BOOSTER STATION
13. TROWBRIDGE BOOSTER STATION
14. KEATON LOOP BOOSTER STATION
15. SAN JOSE WATER COMPANY 6" CONNECTION
16. HIDALGO RESERVOIR & BOOSTER STATION
17. CONRAD RESERVOIR
18. CRANE RIDGE BOOSTER STATION
19. MOUNTAIRE RESERVOIR & BOOSTER STATION
20. ABORN RESERVOIR & BOOSTER STATION

No Scale

Figure 2-4. Edenvale and Coyote Valley Service Areas



COYOTE

1. EDENVALE WELLS #11,#12,#13
2. EDENVALE RESERVOIR
3. COYOTE WELLS
4. COYOTE RESERVOIR

Approximately 950 additional acres of single or multi-family residential land are expected to be developed within the SJMWS service area by 2025. Another major factor for future increases in urban water demand in SJMWS's service area is the estimated large increases in industrial and commercial development. Approximately 1,725 additional acres of industrial and commercial development are expected to be developed by the year 2025.

VI. PLAN COORDINATION

SJMWS has encouraged community participation in its urban water management planning efforts since the first plan was developed in 1985. For this update, preliminary notifications were published in the local newspaper and a formal public meeting was held to allow for public review and comment on the draft plan before City Council's approval. Notice of the public meeting was advertised in the local San Jose Mercury News and San Jose Post Record and posted on the SJMWS internet website.

SJMWS coordinated with several local agencies to encourage input and participation in its planning. To maintain a level of plan consistency, SJMWS attended and participated in several meetings between other local retailers hosted by the Santa Clara Valley Water District. Notification letters were sent to local agencies and other water retailers informing them that the planning efforts were underway, and welcoming any comments or other participation. Coordination between the SJMWS and its wholesalers (Santa Clara Valley Water District and San Francisco Public Utilities Commission) was maintained throughout the planning process. By consulting with the planning documents completed by the wholesalers, including Integrated Water Resources Planning studies and Groundwater Management Plans, the SJMWS is better able to plan for future water supplies and minimize the need to import water from other regions by creating a realistic, consistent source supply plan.

Copies of all postings and letters are included in Appendix B.

3
Water System Supply

The San Jose Municipal Water System (SJMWS) has facilities for utilizing three main sources of supply: groundwater, San Francisco Water Department/Public Utilities Commission (SFPUC), and Santa Clara Valley Water District (SCVWD). Supply sources received by SJMWS and discussed within this chapter are generally considered consistent sources (see section 1, "North San Jose/Alviso Service Area" for additional discussion), except during times of prolonged drought, during which time supplies are decreased in proportion to wholesale supplies available (see Chapter 4 for a discussion of dry year supplies).

There are currently fourteen wells in the four different service areas. Long term planning includes probable construction of one additional well in Edenvale within the next five years, two to three additional wells in North San Jose within the next five to ten years, and six additional wells in Coyote Valley within the next twenty years. Supplies to be obtained from these additional sources cannot be quantified, as yield depends on the design and construction of each well. Groundwater, which accounted for three percent of the total water supplied to the SJMWS during 2000-2004, is managed by the SCVWD.

SJMWS receives water from the City and County of San Francisco's regional system, operated by the San Francisco Public Utilities Commission (SFPUC). This supply is predominantly from the Sierra Nevada, delivered through the Hetch Hetchy aqueducts, but also includes treated water produced by the SFPUC from its local watersheds and facilities in Alameda and San Mateo Counties. This supply accounted for 25% of the SJMWS deliveries from 2000-2004.

SJMWS has a contract with SCVWD for delivery of water imported to the County from the Sierra Nevada mountains (via the Sacramento/San Joaquin Delta) and water collected from local sources. This water is delivered by the State Water Project (SWP) and the Central Valley Project (CVP). Imported water is conveyed to Santa Clara County through 3 main pipelines: the South Bay Aqueduct, which carries water from the SWP, and the Santa Clara Conduit and Pacheco Conduit, which bring water from the CVP. This supply accounted for 72% of the SJMWS deliveries from 2000-2004.

I. NORTH SAN JOSE/ALVISO SERVICE AREA

The North San Jose/Alviso Service receives water from the San Francisco Public Utility Commission (SFPUC) via Hetch-Hetchy system through two (2) turnouts at the Hetch-Hetchy Aqueduct. The City currently has a contract for up to 3,000 acre feet per year with SFPUC, defined as temporary and interruptible with two year notice by SFPUC. The contract is scheduled for renegotiation in 2009, at which time SJMWS aims to become a permanent, uninterruptible user.

Four wells located in North San Jose/Alviso, with a total capacity of 6,000 gallons per minute, can be used to supplement the Hetch-Hetchy supply. The North San Jose-Alviso service system has two storage tanks with a combined storage capacity of six million gallons and two booster stations that have a pumping capacity of 12,000 gpm. The system pressures are maintained between 70 and 90 pounds per square inch by pressure regulators, pump stations,

and reservoirs. These pressure regulators and other system facilities such as pipelines and pump stations ensure adequate domestic and fire protection supplies.

II. EVERGREEN SERVICE AREA

The primary source of water for the Evergreen Service Area, approximately 99%, is treated water supplied by the Santa Clara Valley Water District (SCVWD) from the State Water Project through the South Bay Aqueduct and San Luis Reservoir through the San Felipe Project. The SJMWS has a long-term contract for imported water. Four wells located at SJMWS's Loupe-Tuers Pump Station are used to supplement the SCVWD's source of supply. They have a combined capacity of 5,975 gpm. The Evergreen service system has 13 storage tanks with a combined storage capacity of 24.6 million gallons.

System pressures in the Evergreen area are maintained by elevated distribution storage reservoirs sited at established elevations on adjacent hillsides (see Figure 3-1). Water system pressures are established to provide reasonable water service to customers. This ensures that customers have adequate pressures to all parts of their households and that large fire flows will not cause a negative pressure gradient in the distribution system. The reservoir levels are maintained by pumps and the zones have been established as follows:

Pressure Zone No. 1	Elevation 125-275 feet
Pressure Zone No. 2	Elevation 275-375 feet
Pressure Zone No. 3&4	Elevation 375-630 feet
Pressure Zone No. 5&6	Elevation 630-880 feet
Pressure Zone No. 7&8	Elevation 875-975 feet

III. EDENVALE SERVICE AREA

The Edenvale area is serviced entirely with groundwater. There are three wells within the service area, with a capacity of 3,400 gpm. There are tentative plans to construct one new well in the Edenvale service area within the next five years, both to meet increasing water demands projected over the next twenty years and to increase water supply reliability. The Edenvale area contains a storage tank with a capacity of three million gallons.

IV. COYOTE VALLEY SERVICE AREA

There are three wells which serve the entire Coyote service area. The three wells have a combined capacity of 5,550 gpm. The service area contains a 3.6 million gallon storage tank.

V. SUPPLY PROJECTIONS

Table 3-1 provides water supply projections by source through the year 2030. Supply projections were coordinated with SCVWD and SFPUC (Appendix C). Recycled water projections are given in Chapter 6.

Figure 3-1. San Jose Municipal Water System - Evergreen

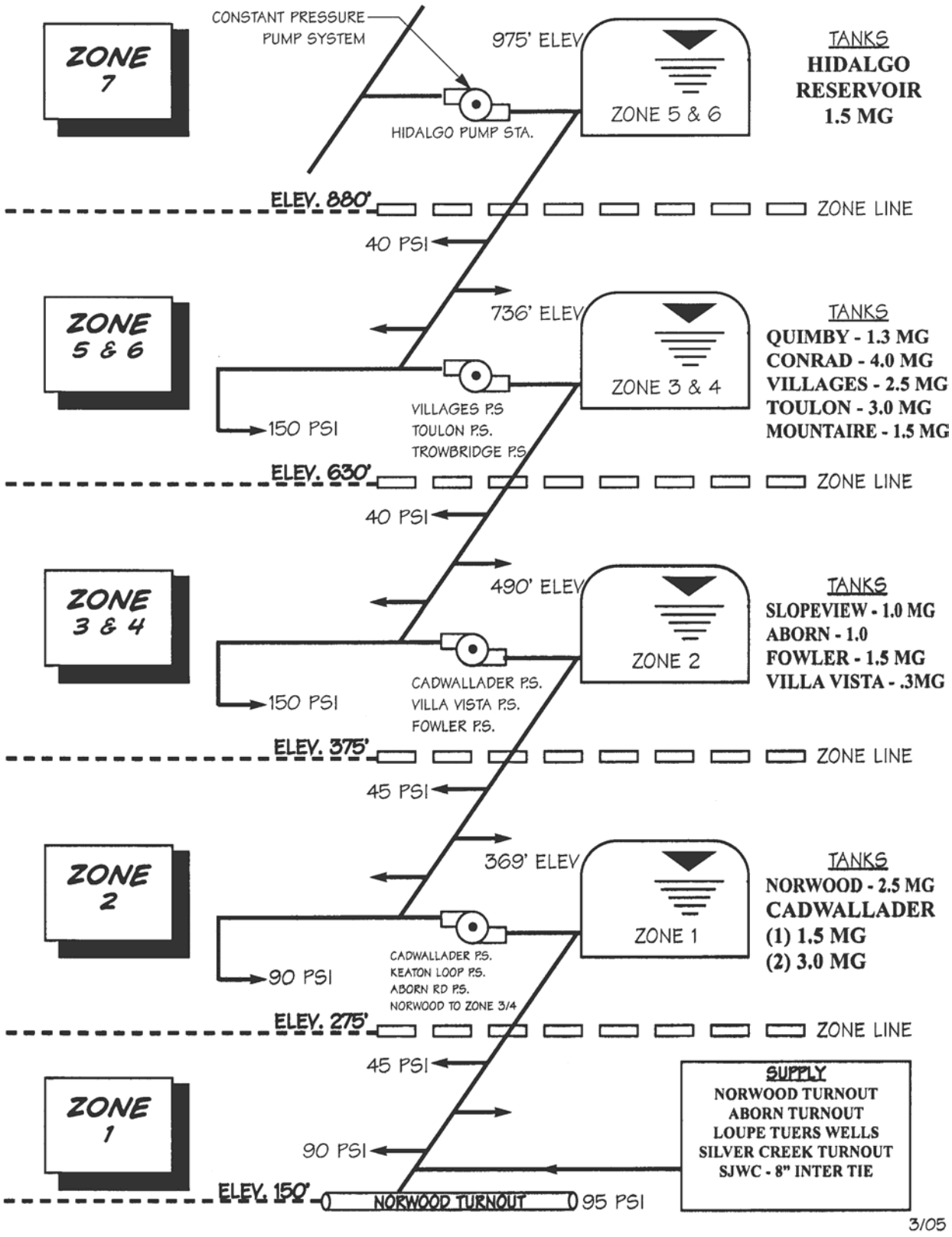


Table 3-1. Current and Projected Potable Supplies by Agency*						
	2005		2010		2015	
Agency	**AF**	**%Total**	**AF**	**%Total**	**AF**	**%Total**
SFPUC	5,400	23	7,040	25	7,100	21
SCVWD-Treated	16,800	72	17,400	61	17,350	52
SCVWD-Groundwater	1,000	4	4,160	15	8,850	27
Total	23,200		28,600		33,300	
	2020		**2025**		**2030**	
Agency	**AF**	**%Total**	**AF**	**%Total**	**AF**	**%Total**
SFPUC	7,100	19	7,100	16	7,100	15
SCVWD-Treated	17,750	47	18,500	43	18,500	40
SCVWD-Groundwater	12,900	34	17,700	41	20,900	45
Total	37,750		43,300		46,500	

*The proportion of supplies received by the District (i.e., treated water and groundwater) may vary to ensure consistency with the District's long-term water management strategies. See Chapter 6 for recycled water information.

VI. WATER YEAR DEFINITIONS

Average Water Year

The SCVWD has identified the average water year as the average supply available over the historic hydrologic record, given currently existing facilities. For imported supplies, this is the average supply expected with currently existing facilities and contractual demands over the historical hydrology from 1922 through 1990, with current environmental regulations in place. This is not the same as the average of the actual past water deliveries from these sources. Ultimately, if historical hydrology were to recur, the water supply would depend on the amount of water available, not on the amount actually received in the past.

Singly Dry Year Supply

SCVWD has identified that if the single dry year equivalent to the hydrology of 1977 were to be repeated with current facilities in place, SCVWD's supply from the Central Valley Project could be cut back to health and safety levels. SFPUC modeling and historic hydrological sequence identifies 1987 as the model single dry year.

Multiple Dry Year Supply

SCVWD has identified that if a repeat of the hydrology of the years 1988-1992 were to occur, the multiple dry year supplies would be decreased. The water supply availability to individual retailers will ultimately be determined by SCVWD and SFPUC. SJMWS will work closely with SCVWD, SFPUC, and other water retail agencies to implement any stages of action to reduce the demand for water during water shortages. In response to AB11X, the City of San Jose prepared a Water Shortage Contingency Plan in 1991 to supplement the Urban Water Management Plan. The Water Shortage Contingency Plan, described in detail in Chapter 5, details the stages of action to be implemented in case of a supply shortage. Chapter 4 includes multiple dry year scenarios for water supply availability through 2030.

VII. RELIABILITY OF SUPPLIES

Santa Clara Valley Water District

To maintain water supply reliability and flexibility, the District's water supply includes a variety of sources including local groundwater, imported water, local surface water, and recycled water. The District has an active conjunctive water management program to optimize the use of groundwater and surface water, and to prevent groundwater overdraft and land subsidence.

The SCVWD's 2003 Integrated Water Resources Planning Study (IWRP) was developed to address the potential water supply short-fall, and to ensure a reliable supply of high-quality water. IWRP 2003 Draft (Appendix D) found that small shortages could be managed through demand reduction programs and voluntary cutbacks without significant economic losses to the community. The plan also developed four options for increasing the reliability of the water supply: water banking, recycled water (discussed in detail in Chapter 6), water conservation measures, and water transfers.

Long term planning and modeling analysis performed by the District as part of the IWRP 2003 Draft and UWMP 2005 indicates that if additional investments are made, future countywide demands can reliably be met. It is the intent of the District to ensure that these additional investments be undertaken in accordance with the IWRP framework, which recommends a flexible resource mix be implemented in phases over the planning horizon. This flexibility allows the District to respond to changing and uncertain future conditions.

The water supply will be reliable to meet future countywide demands. The IWRP's strength is its inherent flexibility and integrated approach to water resources management. Although this UWMP presents projections of future water supply by source, ongoing coordination with the District will be necessary to ensure projections are consistent with the District's long-term water management strategies. We will continue to work with the District to refine future water supply projections and ensure long-term planning efforts are consistent.

In determining the long-range availability of water, consideration must be given to the vulnerability of imported supplies to the effects of prolonged state-wide drought. If the Department of Water Resources (DWR) or United States Bureau of Reclamation (Bureau) were to temporarily reduce SCVWD allocations of State Project water or CVP-San Felipe Division water, this would result in a temporary supply shortfall for SJMWS and the other Santa Clara Valley Water District retailers. Although SJMWS has the facilities to pump additional groundwater, the Evergreen Service Area, whose current supplies are 99% imported water, could be faced with supply deficiency, especially during the summer months. Water demands associated with continued population growth and potential droughts could be met with additional imported water supply, water conservation measures, and with expanded recycled water use (see Chapter 6).

The SCVWD obtains its supplies from a variety of sources to maintain maximum efficiency, flexibility, and reliability, including local and imported water supplies. The District augments natural groundwater recharge with a managed recharge program to offset groundwater pumping, sustain storage reserves, and minimize the risk of land subsidence. Through these recharge activities, the District works to keep groundwater basins "full" to protect against drought. Storing surplus water in the groundwater basins enables part of the supply to be carried over from wet years to dry years. The District also has a contract for 100,000 af/yr from the State Water Project (SWP), and 152,500 af/yr from the Central Valley Project (CVP). A

Water Reallocation Agreement negotiated with the Bureau of Reclamation and San Luis & Delta-Mendota Water Authority in 1997 established a basic delivery level of no less than 97,500 af/yr for the CVP contract. The District has several other methods of managing supplies, including the Semitropic Water Storage District.

If demands are anticipated to reach the upper end of the demand range, SCVWD could consider additional long-term transfers of up to 25,000 af/yr. SCVWD has plans to purchase long-term water transfers of up to 25,000 acre-feet within the next 10 years. Alternatives include contracts for either dry-year options or entitlement transfers. If SCVWD future projections indicate that the year 2020 water demand may exceed SCVWD's projected 450,000 af/yr, an additional long-term transfer of up to 25,000 af/yr may be appropriate before year 2020. The timing for securing such additional supplies depends on where future water demands appear to be falling within the demand planning range and on the water transfer opportunities that arise. As mentioned earlier, additional water recycling (if it develops) may substitute for some or all of the water transfer components in the preferred strategy.

Finally, groundwater supply in the SJMWS service area would afford some buffer against water shortages under short-term drought conditions. However, the threat of land subsidence caused by overdraft of the groundwater basin is a limiting factor in averting water shortages during prolonged drought.

The SCVWD system is vulnerable to the possibility of a prolonged disruption in service in the event of an earthquake, flood or other catastrophic event. The current estimate of the average outage period until restoration of supplies is approximately 30-45 days. The District is currently examining their system vulnerability, and evaluating several options to decrease the average outage period following a catastrophic event to 1-14 days. Some of the options to improve reliability include stockpiling pipe and materials and improved emergency planning, additional seismic studies and subsequent retrofits, additional sources of water supplies, and increased redundancy of the SCVWD system (SCVWD, 2005).

Several local agencies are exploring the possibility of obtaining water supplies from new sources to supplement existing supplies. For example, the Bay Area's four largest water agencies, East Bay Municipal Utility District, the San Francisco Public Utilities Commission, Contra Costa Water District and the Santa Clara Valley Water District, are jointly exploring developing the feasibility of regional desalination facilities that could directly or indirectly benefit 5.4 million San Francisco Bay Area residents and businesses served by these agencies.

To ensure optimal water quality, SCWVD implements and continues to identify potential management practices that could improve source water quality and reduce impact of potential contaminant sources. The district completes a Watershed Sanitary Survey every five years, as required by the California Department of Health Services (DHS), to examine possible sources of drinking water contamination and recommend how to protect water quality at the source. Also as required by DHS as part of the Drinking Water Source Assessment and Protection Program, an assessment of the drinking water sources for the SCVWD was completed in 2002.

The SCVWD's sources are susceptible to potential contamination from a variety of land use practices, such as agricultural and urban run off, recreation activities, livestock grazing, and residential and industrial development. In addition, SCVWD's local sources are also vulnerable to potential contamination from commercial stables and historic mining practices. The District's Water Quality Unit monitors surface water quality in SCVWD's reservoirs, and has previously determined that no contaminant associated with any of these activities has been detected in the

SCVWD'S treated water. The water treatment plants also provide multiple barriers for physical removal and disinfection of contaminants.

SCVWD's imported water from Bay Delta contains a relatively high concentration of salts (bromide) and organic compounds. These constituents are precursors to the formation of disinfection by-products, a major concern for SCVWD. Currently SCVWD is in the process of major renovations at each of its three water treatment plants to utilize ozone as the primary disinfectant. When using ozone as the primary disinfectant, minimizing bromate formation becomes a concern. SCVWD's imported water (Delta water) will only be able to meet current and anticipated increasingly stringent drinking water standards through source water quality improvements and advanced treatment technologies. A possibility identified by the District to address the bromide in the imported water is to blend the source water for the treatment plants with other source water, such as local surface water or groundwater.

Delta water quality could also be adversely impacted by global warming. A rise in average temperature could result in increased salinity in Delta water. Under any climate change-impacted scenario, the District may need to consider additional treatment options to respond to water quality impacts such as increased salinity in the Delta, additional storage to take advantage of more wet-season water, additional all-weather supply to replace reduced water supply from existing sources, and additional water transfers.

Groundwater

The groundwater system in the County performs multiple functions: treatment, transmission, and storage. Water enters the groundwater subbasins through recharge areas generally located at or near the subbasins' perimeter, and is transmitted into the deeper confined aquifer of the central part of the valley. In the process, the water is filtered and becomes suitable for drinking. Eventually the groundwater reaches pumping zones, where it is extracted for municipal, industrial, and agricultural uses. The groundwater basin has vast storage capacity, enabling supplies to be carried over from wet years to dry years.

The Santa Clara Valley Groundwater Basin provides about half of the County's water supply for potable use, through pumping by retail water agencies or individual well owners. The basin is divided into three interconnected subbasins: the Santa Clara Valley Subbasin in North County and the Coyote and Llagas Subbasins in South County.

The Santa Clara Valley Subbasin extends from Coyote Narrows at Metcalf Road to the County's northern boundary. It is bounded on the west by the Santa Cruz Mountains and on the east by the Diablo Range; these two ranges converge at the Coyote Narrows to form the southern limit of the subbasin. The subbasin is 22 miles long and 15 miles wide, with a surface area of 225 square miles. A confined zone within the northern areas of the subbasin is overlaid with a thick clay layer. The southern area is the unconfined zone, or forebay, where the clay layer does not extend. SCVWD staff estimates the operational storage capacity of the subbasin to be 350,000 af. Although the annual storage capacity depends on current groundwater conditions and hydrology, the District has determined that for any given year, groundwater withdrawals in the Santa Clara Valley Subbasin should not exceed 200,000 af to avoid land subsidence. The District uses this 200,000 af limit in determining the amount of supply that can be obtained from the basin, and monitors to ensure that the limit is not exceeded.

The Llagas Subbasin extends from Cochran Road, near Morgan Hill, south to the County's southern boundary. It is connected to the Bolsa Subbasin of the Hollister Basin and bounded to the south by the Pajaro River (the Santa Clara-San Benito county line). The Llagas Subbasin is approximately 15 miles long, 3 miles wide along its northern boundary, and 6 miles wide along the Pajaro River. The subbasin surface area is approximately 74 square miles. A thick clay layer which extends north from the Pajaro River divides this subbasin into confined and forebay zones. SCVWD staff has estimated the operational storage capacity of this subbasin at 150,000 af.

The Coyote Subbasin extends from Metcalf Road south to Cochran Road, and drains into both the Llagas and the Santa Clara Valley Subbasins. This subbasin is approximately 7 miles long and 2 miles wide and has a surface area of approximately 15 square miles. The entire subbasin is unconfined and has no thick clay layers. The District estimates the operational storage capacity of the Coyote Subbasin to be between 23,000 and 33,000 acre-feet.

The SCVWD operates and maintains 18 major recharge ponds, with a combined surface area of more than 320 acres, and over 30 local creeks. Runoff is captured in the District's reservoirs and released into both instream and offstream recharge ponds for percolation into the groundwater basin. In addition, imported water is delivered by the raw water conveyance system to streams and ponds for groundwater recharge. The capacity of these recharge systems is 138,000 af.

The Santa Clara Valley Groundwater Basin is not adjudicated and has not been identified or projected to be in overdraft by DWR. The quality, supply, and management of the local groundwater basin is monitored by the District and summarized in their Groundwater Management Plan (Appendix E), most recently updated and adopted in 2001. Groundwater is a source of supplemental water supply for SJMWS's North San Jose/Alviso and Evergreen service areas. The Edenvale and Coyote Valley service areas are supplied entirely by the groundwater. During the past five years, SJMWS's groundwater demands have been sufficiently met.

Overall groundwater quality in Santa Clara County is good. The most notable exceptions are nitrate and perchlorate, which have impacted groundwater quality in South County. Historically, no perchlorate has been detected in any of the groundwater sources within SJMWS's service areas. The groundwater sources have also met all drinking water standards, including levels of nitrate. Nitrate detection in SJMWS service areas' groundwater has been historically low and well below the maximum contaminant level set by Federal and State Regulations. Constant monitoring of all wells is required, as wells are vulnerable to potential contamination from local sources and activities.

As required by DHS for their Drinking Water Source Assessment and Protection Program, drinking water source assessments were conducted for all 14 groundwater wells within the SJMWS service areas during 2003/2004. The assessments were conducted by the SJMWS staff, and consisted of information gathered from City records, databases, staff, the Water Resources Control Board, and visual field surveys.

In North San Jose, potential contamination sources include local electronic manufacturing facilities, gas stations, leaking underground storage tanks and sewer collection facilities. The Edenvale wells are vulnerable to chemical/petroleum processing storage activities. The Evergreen wells are vulnerable to automobile gas stations,

underground storage tank leaks and dry cleaning service activities. The Coyote wells are vulnerable to contamination caused by agricultural drainage, illegal activities/unauthorized dumping, storage tank leaks and sewer collection systems. However, the existing well locations and precautions taken during construction in combination with the local hydrology have provided a high level of protection against contamination of the local ground waters.

Saltwater intrusion has occurred in the shallow aquifer beneath North San Jose/Alviso. Saltwater from the Bay moves upstream during high tides and leaks through the clay cap into the upper aquifer zone when this zone is pumped. Land subsidence has also aggravated this condition. Elevated salinity is also present in the lower aquifer zone, but on a much smaller scale, and is attributed to improperly constructed, maintained, or abandoned wells that penetrate the clay aquitard and provide a conduit from the upper to the lower aquifer zone. In response, SCVWD has established an extensive program to locate and properly destroy such conduit wells (SCVWD, 2001).

As the groundwater management agency in Santa Clara County, SCVWD has ongoing groundwater protection programs to ensure high water quality and more reliable water supplies. These programs includes well permitting, well destruction, wellhead protection, land use and development review, nitrate management (targeted to areas of elevated nitrate in the South County), saltwater intrusion programs, and providing technical assistance to regulatory agencies to ensure local groundwater resources are protected (SCVWD, July 2001).

San Francisco Public Utilities Commission

The City of San Jose receives water from the San Francisco Water Department/Public Utilities Commission (SFPUC) via the Hetch-Hetchy pipeline to supply a portion of the water to the North San Jose area. The regional water system provides water to 2.4 million people in San Francisco, Santa Clara, Alameda and San Mateo counties. Approximately 85% of the water supply comes from the Hetch-Hetchy Reservoir, located in Yosemite National Park, and 15% comes from runoff in Alameda and Peninsula watersheds. The system consists of over 280 miles of pipelines, over 60 miles of tunnels, 11 reservoirs, five pump stations and two water treatment plants.

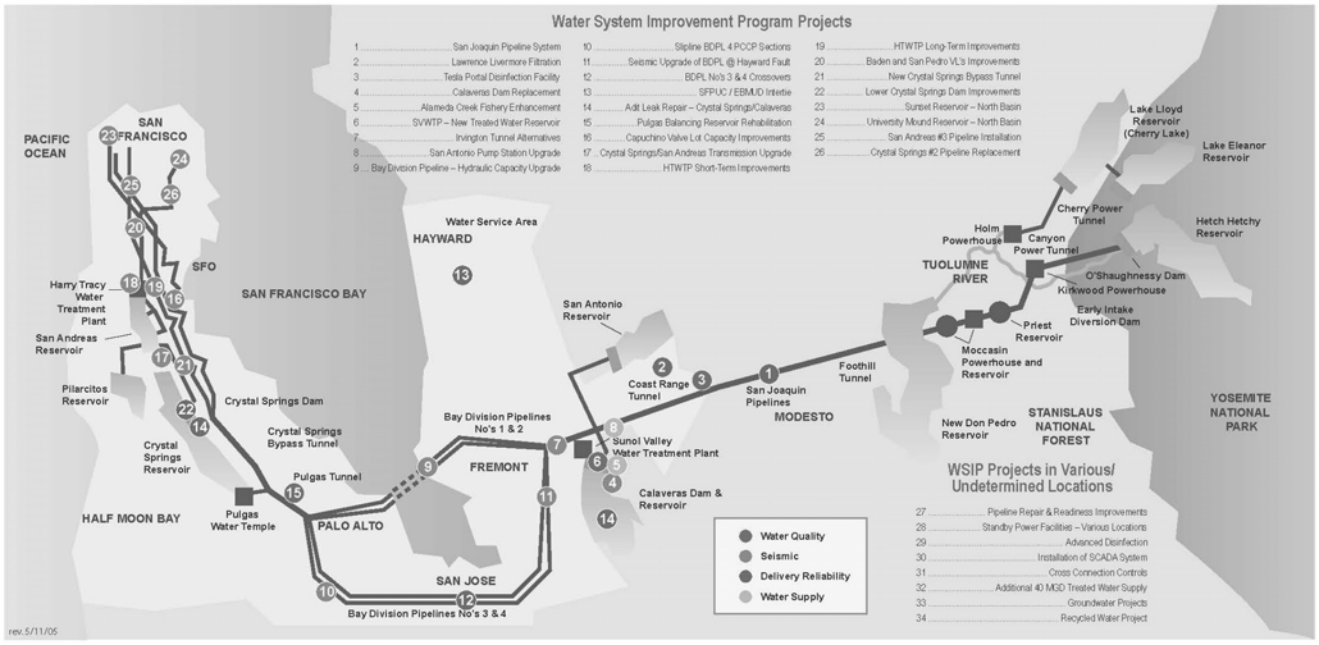
The amount of imported water available to the SFPUC's retail and wholesale customers is constrained by hydrology, physical facilities, and the institutional parameters that allocate the water supply of the Tuolumne River. Due to these constraints, the SFPUC is very dependent on reservoir storage to firm-up its water supplies.

The SFPUC serves its retail and wholesale water demands with an integrated operation of local Bay Area water production and imported water from Hetch Hetchy. In practice, the local watershed facilities are operated to capture local runoff.

In order to enhance the ability of the SFPUC water supply system to meet identified service goals for water quality, seismic reliability, delivery reliability, and water supply, the SFPUC is undertaking a Water System Improvement Program (WSIP). The WSIP will deliver capital improvements aimed at enhancing the SFPUC's ability to meet its water service mission of providing high quality water to its customers in a reliable, affordable and environmentally sustainable manner (see Figure 3-2). The origins of the WSIP are rooted in the "Water Supply

Master Plan" (April 2000). Planning efforts for the WSIP gained momentum in 2002 with the passage of San Francisco ballot measures Propositions A and E, which approved the financing for the water system improvements. Also in 2002, Governor Davis approved Assembly Bill No. 1823, the Wholesale Regional Water System Security and Reliability Act. The WSIP is expected to be completed in 2016.

Figure 3-2. SFPUC Water System Improvement Program Projects



A Program Environmental Impact Report (PEIR) is being prepared under the California Environmental Quality Act (CEQA) for the Water Supply Improvement Program. A PEIR is a special kind of Environmental Impact Report under CEQA that is prepared for an agency program or series of actions that can be characterized as one large project. PEIRs generally analyze broad environmental effects of the program with the acknowledgment that site-specific environmental review may be required at a later date.

Projects included in the WSIP will undergo individual project specific environmental review as required. Under CEQA, project specific environmental review would result in preparation of a Categorical Exemption, Negative Declaration or Environmental Impact Report. Each project will also be reviewed for compliance with the National Environmental Policy Act and local, state and federal permitting requirements as necessary.

The business relationship between San Francisco and its wholesale customers is largely defined by the "Settlement Agreement and Master Water Sales Contract (Master Contract)" executed in 1984. The Master Contract primarily addresses the rate-making methodology used by the City in setting wholesale water rates for its wholesale customers in addition to addressing water supply and water shortages for the regional water system. The contract expires on June 30, 2009.

The SFPUC can meet the water demands of its retail and wholesale customers in wet and normal years. The Master Contract allows the SFPUC to reduce water deliveries during droughts, emergencies, and for scheduled maintenance activities. The Interim Water Shortage

Allocation Plan (IWSAP) between the SFPUC and its wholesale customers adopted in 2000 provides that the SFPUC determines the available water supply in drought years for shortages of up to 20% on an average, system-wide basis.

The SFPUC predicts that at current delivery levels and operating criteria, the system will have delivery deficiencies of ten to twenty percent in about one year in every nine on average, with several additional water supply options for both normal and dry years (Table 3-2).

Table 3-2. SFPUC Water Supply Options Through 2030

	2010	2015	2020	2025	2030
Crystal Springs Reservoir (22 bg)	x	x	x	x	x
Westside Basin Groundwater (af)	4,500	7,000	8,100	8,100	8,100
Calaveras Reservoir Recov. (31.5 bg)		x	x	x	x
District's Transfer (af)	23,200	23,200	29,000	29,000	29,000

The SFPUC can meet the demands of its retail and wholesale customers in years of average and above-average precipitation. The Master Contract allows the SFPUC to reduce water deliveries to wholesale customers during periods of water shortage. Under the Master Contract, reductions to wholesale customers are to be based on each agency's proportional purchases of water from the SFPUC during the year immediately preceding the onset of shortage, unless this formula is supplanted by a water conservation plan agreed to by all parties.

The Master Contract's default formula discouraged SFPUC's wholesale customers from reducing purchases from SFPUC during periods of normal water supply through demand management programs or development of alternative supplies. To overcome this problem, SFPUC and its wholesale customers adopted an Interim Water Shortage Allocation Plan (IWSAP) in calendar 2000. This IWSAP applies to water shortages up to 20% on a system-wide basis and will remain in effect through June 2009.

The IWSAP has two components. The Tier One component of the IWSAP allocates water between San Francisco and the wholesale customer agencies collectively. The IWSAP distributes water between two customer classes based on the level of shortage (as shown in Table 3-3).

Table 3-3. SFPUC Shortage Allocation

Level of System Wide Reduction in Water Use Required	Share of Available Water	
	SFPUC Share	Suburban Purchasers Share
5% or less	35.50%	64.50%
6% through 10%	36.00%	64.00%
11% through 15%	37.00%	63.00%
16% through 20%	37.50%	62.50%

The Tier Two component of the IWSAP allocates the collective wholesale customer share among each of the 28 wholesale customers. This allocation is based on a formula that takes three factors into account, the first two of which are fixed: (1) each agency's Supply Assurance from SFPUC, with certain exceptions, and (2) each agency's purchases from SFPUC during the three years preceding adoption of the Plan. The third factor is the agency's rolling average of

purchases of water from SFPUC during the three years immediately preceding the onset of shortage.

The IWSAP allows for voluntary transfers of shortage allocations between SFPUC and any wholesale customer and between wholesale customer agencies. Also, water "banked" by a wholesale customer, through reductions in usage greater than required, may also be transferred.

The Bay Area Water Supply and Conservation Agency (BAWSCA) was created on May 27, 2003 to represent the interests of 26 cities and water districts, and two private utilities, in Alameda, Santa Clara and San Mateo counties that purchase water on a wholesale basis from the San Francisco Regional Water System.

BAWSCA is the only entity having the authority to directly represent the needs of the cities, water districts and private utilities (wholesale customers) that depend on the regional water system. BAWSCA provides the ability for the customers of the regional system to work with San Francisco on an equal basis to ensure the water system gets fixed, and to collectively and efficiently meet local responsibilities.

BAWSCA has the authority to coordinate water conservation, supply and recycling activities for its agencies; acquire water and make it available to other agencies on a wholesale basis; finance projects, including improvements to the regional water system; and build facilities jointly with other local public agencies or on its own to carry out the agency's purposes.

Compliance with the Urban Water Management Planning Act lies with each agency that delivers water to its customers. In this instance the responsibility for completing an UWMP lies with the individual BAWSCA member agencies. BAWSCA's role in the development of the 2005 UWMP updates is to work closely with its member agencies and the SFPUC to maintain consistency between the multiple documents being developed and to ensure overall consistency with the WSIP and the associated environmental documents.

BAWSCA and its member agencies look for opportunities to work with other water agencies, including the SFPUC and SCVWD, and leverage available resources in implementing water use efficiency projects. For example, in 2005, the SFPUC and BAWSCA entered into a Memorandum of Understanding (MOU) regarding the administration of a Spray Valve Installation Program. Through this MOU, SFPUC and BAWSCA will work cooperatively to offer and coordinate installation of water conserving spray valves to food service providers in BAWSCA member service areas. Recently the Bay Area Efficient Clothes Washer Rebate Program, a single rebate program offered by all major water agencies in the greater Bay Area including BAWSCA and the SFPUC, was recipient of $1.5M in Proposition 50 grant funds for implementation as early as FY 2006/2007.

BAWSCA and its member agencies will continue to look to partner with other agencies to develop regional water conservation efforts that look beyond local issues of supply and cost-effectiveness to examine costs, benefits and other related issues on a system-wide level. The goal is to maximize the efficient use of water regionally by capitalizing on variations in local conditions and economies of scale.

The source water quality of SFPUC's Hetch Hetchy supply is generally very high. The Hetch Hetchy Reservoir captures water inflows coming from spring snowmelt runoff and the Tuolomne River. Hetch Hetchy water meets all the state and federal criteria for watershed protection,

disinfection treatment, bacteriological quality and operational standards. As a result, the US Environmental Protection Agency and DHS granted the Hetch Hetchy water source a filtration exemption. SFPUC maintains the filtration exemption by monitoring Hetch Hetchy weather conditions, water turbidity levels, coliform bacteria levels, disinfectant levels, and parasite and other pathogen concentrations. Also, they comply with disinfection, sampling and reporting requirements and conduct regular inspections of the protected Hetch Hetchy watershed and reservoirs.

The Alameda watershed, located in the East Bay, consists of the Calaveras and San Antonio Reservoirs. The Peninsula watershed captures runoff in Crystal Springs and San Andreas Reservoirs, as well as two smaller reservoirs, Pilarcitos and Stone Dam. These local sources are treated and filtered at Sunol Valley Water Treatment Plant.

In 2000, SFPUC conducted a source assessment for the Drinking Water Source Assessment and Protection Program. The SFPUC watersheds are vulnerable to contaminants associated with wildlife and to a limited extent human recreational activity. Historically, the levels of contaminants have been very low in the watersheds. Even considering the high quality water source, SFPUC recently implemented chloramine disinfection of drinking water in order to reduce disinfection byproducts caused by standard chlorination. As previously discussed, SFPUC is continuing efforts to deliver capital improvements aimed at enhancing their ability to meet their water service mission of providing high quality water to their customers in a reliable, affordable and environmentally sustainable manner.

VIII. TRANSFER/EXCHANGE OPPORTUNITIES

The SCVWD is continuing its efforts to negotiate with the City of San Francisco on issues of a tie-in and water exchanges or transfers. These efforts are described in the SCVWD Urban Water Management Plan. SJMWS currently has connection points with the City of Santa Clara and San Jose Water Company for short-term transfers to be used in the case of an emergency or temporary interruption.

4
WATER DEMAND

I. HISTORICAL

Water use has climbed steadily from 1978 until 1988, when it began to decline in response to a drought-related water conservation and allocation program. Since 1991, when water usage reached its lowest level in response to enforced drought-related conservation measures, the use of water has been steadily increasing in the SJMWS service areas. In 1993, total water usage had recovered from the drought, surpassing the previous high usage year of 1987. However, these numbers do not account for the population increase in the SJMWS service areas. Table 4-1 reflects the total yearly water use in acre feet per year by the SJMWS since 1980.

Table 4-1. Historical and Present Water Production in the SJMWS Service Areas*

	NSJ/ALVISO (af/yr)			EVERGREEN (af/yr)			EDENVALE (af/yr)	COYOTE (af/yr)	
YEAR	SFPUC	WELLS	TOTAL	SCVWD	WELLS	TOTAL	WELLS	WELLS	TOTAL
1980	1215	--	1215	5814	530	6344			7559
1981	1541	--	1541	5328	1566	6894			8435
1982	1756	--	1756	5915	697	6612			8368
1983	2095	109	2204	6396	678	7074			9278
1984	2840	311	3151	7297	1091	8387	44		11582
1985	3255	138	3393	8083	810	8893	124		12410
1986	3382	65	3446	8535	900	9435	102		12983
1987	3426	269	3695	8853	1133	9986	135		13816
1988	2638	615	3253	9244	855	10100	157	40	13550
1989	2649	48	2697	8783	82	8865	101	41	11704
1990	2512	540	3152	9118	40	9158	114	52	12476
1991	1913	924	2837	8280	11	8291	99	46	11273
1992	2443	811	3254	10198	11	10209	123	57	13643
1993	3057	517	3574	10256	14	10270	95	48	13987
1994	3390	541	3931	11237	6	11243	98	55	15328
1995	4139	7	4146	11060	40	11100	92	59	15397
1996	4474	117	4591	11846	11	11857	111	54	16613
1997	4686	189	4875	13795	5	13800	112	70	18857
1998	4539	354	4893	12104	6	12110	121	52	17176
1999	4989	0.01	4989	13750	5	13755	234	35	19013
2000	5303	0.03	5303	14285	1.4	14287	500	64	20154
2001	5207	0.06	5207	14805	2	14807	605	74	20692
2002	5207	0.08	5208	15275	0.85	15276	577	73	21134
2003	5171	0.05	5171	15541	4	15545	580	59	21355
2004	5300	0.00	5300	16561	0.37	16561	535	61	22457

*Discrepancies between noted water production and demand due to dissimilar billing cycles

II. WATER DEMAND

Past, current and projected water use in SJMWS service areas are summarized by classification of the water delivered to all customers in Table 4-2, and by service area in Table 4-3. The SJMWS supplies water to meet the demands of the population within its service areas, and does not supply the potable demands of any other local agencies or environmental needs. Population is a primary factor affecting urban water demand. Prior to 1995, demand for service connections was growing at about 600 service connections per year; between 2000-2004 the demand for service connections grew at about 500 service connections per year. The present and projected water demands for the SJMWS are shown in Table 4-2, which show that SJMWS will experience significant growth in demand. From 2005 to 2030 potable demand will increase by 23,300 af/yr. The increase in demand is mostly attributable to several proposed development projects within the SJMWS service areas, including the Vision North San Jose, Coyote Valley Specific Plan and Evergreen/East Hills Vision Strategy projects.

Table 4-2. Past, Current, and Projected Water Use for the SJMWS (af/yr)

Customer Type	2000	2005	2010	2015	2020	2025	2030
Single family residential	9,728	10,800	13,314	15,501	17,573	20,157	21,646
Multi-family residential	2,121	2,354	2,902	3,379	3,831	4,394	4,719
Commercial	1,365	1,516	1,868	2,175	2,466	2,829	3,038
Industrial	2,455	2,726	3,360	3,913	4,435	5,088	5,463
Institutional/Governmental	525	582	718	836	948	1,087	1,167
Irrigation	4,396	4,880	6,016	7,005	7,941	9,108	9,781
Other Temp	308	342	421	491	556	638	685
Total Potable*	**20,898**	**23,200**	**28,600**	**33,300**	**37,750**	**43,300**	**46,500**
Total incl. Recycled Water**	22,282	26,200	32,100	39,200	46,150	54,100	59,700

Table 4-3. Projected Demand for the SJMWS by Service Area (af/yr)

Service Area	2005	2010	2015	2020	2025	2030
North San Jose/Alviso	5,500	7,600	9,100	10,600	12,100	12,600
Edenvale	550	1,100	1,600	2,200	3,000	3,200
Coyote***	350	1,600	3,300	5,200	7,200	9,200
Evergreen	16,800	18,300	19,300	19,750	21,000	21,500
Total Potable*	**23,200**	**28,600**	**33,300**	**37,750**	**43,300**	**46,500**
Total incl. Recycled Water**	26,200	32,100	39,200	46,150	54,100	59,700

* An addition of 3% to projected amounts may be estimated to quantify total demand including unaccounted for system losses

** See Chapter 6 for additional information on Recycled Water

*** Demands for Coyote Valley are based on the Coyote Valley Specific Plan, and exclude those demands related to the identified Greenbelt and "Outside Project Area" lands that are outside of the SJMWS service area.

III. COMPARISON OF WATER SUPPLY AND DEMAND

Current and projected water supplies and demands are summarized in Table 4-4 to the year 2030. Except in the case of prolonged drought, the SCVWD and SFPUC projections of supply indicate that there is adequate water supply to meet demands projected by SJMWS through the year 2030 provided that planned strategies are implemented. SJMWS currently owns sufficient groundwater production facilities to extract groundwater to meet current demands. Long-term planning includes the probable construction of additional wells in Edenvale, North San Jose, and Coyote Valley. Water demands associated with continued population growth and potential droughts will be met with additional groundwater, imported water supply, water conservation measures, and with expanded recycled water uses.

Table 4-4. Potable Supply/Demand Projection Comparisons (af/yr)

Normal Water Year	**2010**	**2015**	**2020**	**2025**	**2030**
SFPUC	7,040	7,100	7,100	7,100	7,100
SCVWD	21,560	26,200	30,650	36,200	39,400
Total Supply	28,600	33,300	37,750	43,300	46,500
% of year 2005	123.3%	143.5%	162.7%	186.6%	200.4%
Total Demand	28,600	33,300	37,750	43,300	46,500
% of year 2005	123.3%	143.5%	162.7%	186.6%	200.4%
Difference	0	0	0	0	0
Single Dry Year	**2010**	**2015**	**2020**	**2025**	**2030**
SFPUC	7,040	7,100	7,100	7,100	4,930
SCVWD	21,560	26,200	30,650	36,200	41,570
Total Supply	28,600	33,300	37,750	43,300	46,500
% of year 2005	123.3%	143.5%	162.7%	186.6%	200.4%
Total Demand	28,600	33,300	37,750	43,300	46,500
% of year 2005	123.3%	143.5%	162.7%	186.6%	200.4%
Difference	0	0	0	0	0
Multiple Dry Year	**2006**	**2007**	**2008**	**2009**	**2010**
SFPUC	3,775	3,775	3,282	3,282	3,282
SCVWD	20,505	21,585	23,158	24,238	25,318
Total Supply	24,280	25,360	26,440	27,520	28,600
% of year 2005	104.7%	109.3%	114.0%	118.6%	123.3%
Total Demand	24,280	25,360	26,440	27,520	28,600
% of year 2005	104.7%	109.3%	114.0%	118.6%	123.3%
Difference	0	0	0	0	0

Table 4-4. Cont'd					
Multiple Dry Year	**2011**	**2012**	**2013**	**2014**	**2015**
SFPUC	4,436	4,436	3,865	3,865	3,865
SCVWD	25,104	26,044	27,555	28,495	29,435
Total Supply	29,540	30,480	31,420	32,360	33,300
% of year 2005	127.3%	131.4%	135.4%	139.5%	143.5%
Total Demand	29,540	30,480	31,420	32,360	33,300
% of year 2005	127.3%	131.4%	135.4%	139.5%	143.5%
Difference	0	0	0	0	0
Multiple Dry Year	**2016**	**2017**	**2018**	**2019**	**2020**
SFPUC	4,503	4,503	4,503	4,503	3,921
SCVWD	29,687	30,577	31,467	32,357	33,829
Total Supply	34,190	35,080	35,970	36,860	37,750
% of year 2005	147.4%	151.2%	155.0%	158.9%	162.7%
Total Demand	34,190	35,080	35,970	36,860	37,750
% of year 2005	147.4%	151.2%	155.0%	158.9%	162.7%
Difference	0	0	0	0	0
Multiple Dry Year*	**2021**	**2022**	**2023**	**2024**	**2025**
SFPUC	4,649	4,649	4,044	4,649	4,044
SCVWD	34,211	35,321	37,036	37,541	39,256
Total Supply	38,860	39,970	41,080	42,190	43,300
% of year 2005	167.5%	172.3%	177.1%	181.9%	186.6%
Total Demand	38,860	39,970	41,080	42,190	43,300
% of year 2005	167.5%	172.3%	177.1%	181.9%	186.6%
Difference	0	0	0	0	0

*Actual SCVWD multiple dry year supplies for 2021-2025 will depend upon future system development and expansion

IV. DEMAND MANAGEMENT MEASURES

The SJMWS has been a signatory of the California Urban Water Conservation Council (CUWCC) since 1995. As a signatory, SJMWS submits Best Management Practice (BMP) Activity Reports and Coverage Reports to the CUWCC reporting database on a biennial basis. This Plan contains SJMWS's BMP Reports for fiscal years 2001-2002 through 2003-2004 as well as the Coverage Reports (see Appendix F). What follows is a discussion of SJMWS's progress towards fulfillment of the CUWCC's BMP measures for urban water conservation.

Water Conservation activities for the Municipal Water System are implemented by the City of San Jose's Water Efficiency Program (WEP) and the Santa Clara Valley Water District. Since the mid 1990s, WEP has focused primarily on indoor water conservation with the goal of

reduced wastewater flows to the San Jose/Santa Clara Water Pollution Control Plant. Outdoor water conservation activities for the Municipal Water System have been administered by the Santa Clara Valley Water District.

According to the Coverage Report, SJMWS is meeting coverage requirements for implementation of BMPs 3, 4, 6 - 8, 11, 12, and 14. The City has further work to do to fully implement BMPs 1, 2, 5, 9, and 13.

Programs for BMPs 1, 2, 5, and in part, 9, are administered by the Santa Clara Valley Water District. The District acknowledges being behind in reaching the 2007 completion goal for BMP 1. However, the CUWCC is in the process of updating this BMP as most signatories will not meet the goal on time. Although the District has not reached the 75% threshold for compliance with BMP 2, over 215,000 low-flow showerheads and aerators have been distributed county-wide through retailers (including the SJMWS) and public events. The District's recently completed residential baseline study showed that the county is nearing the 75% saturation for the distribution of low-flow showerheads. To administer BMP 5, the District is developing a web-based water-budget program (Web-ITAP) which will be offered to everyone in Santa Clara County. By offering this tool to all large landscape sites (both dedicated meters and mixed-use meters) the Municipal Water System will be in compliance with this BMP. The Municipal Water System will work with the District to publicize this program to System customers.

BMP 9 is being addressed through the City of San Jose's "Water Efficient Technologies" program as well as the District's Commercial/Industrial/Institutional (CII) Water Surveys, Water Efficient Technologies Program, Commercial Toilet Retrofit Program, Commercial Washer Program, Pre-Rinse Sprayer Installation Program, and Innovative CII Retrofits Program. The District states in its UWMP that, to the extent possible, it will compile data on the number of customers and amount of water used within the CII customer classes for its retailers. The Municipal Water System will continue to work with the District to ensure that BMP 9 activities are implemented in the SJMWS service area. To determine if it is in compliance with this BMP, SJMWS will use program data generated by the City of San Jose and District program data to calculate the amount of reduction in CII usage in its service area.

In order to fulfill BMP 13, the City of San Jose would need to implement City-wide ordinances prohibiting single-pass cooling towers and single-pass laundries. The City will embark on an analysis of such ordinances to determine their feasibility.

5
Water Shortage Contingency Plan

I. BACKGROUND

In response to AB11X, the City of San Jose coordinated with SCVWD to create a Water Shortage Contingency Plan in 1991 to supplement the Urban Water Management Plan (see Appendix G). In 1994, the City of San Jose adopted revisions to the City Municipal Code Chapter 15.10 (Appendix H), which included water shortage measures to be enforced during a time of water shortage. This chapter contains a three-year worst case scenario for water supply availability and details on the stages of action to be implemented in case of a supply shortage.

II. WORST CASE WATER SUPPLY AVAILABILITY (2006-2008)

As discussed earlier in this report, the SJMWS relies mostly on the SCVWD for its water supply and is directly affected by the water supply conditions SCVWD faces. This section discusses water supply conditions as it affects Santa Clara County.

As a result of the 1987 to 1992 drought, local reservoirs were reduced and wholesalers received only partial entitlement from its imported sources. In response to these circumstances, SCVWD instituted an aggressive water conservation program and augmented imported sources of water with additional water supplies. Since the end of the drought, local reservoir levels have returned to normal, allowing greater flexibility to meet water demands during a short-term dry period.

In the event of a multiple dry year supply scenario occurring between now and 2020, supplies are planned to be adequate to continue to meet the increased demands. While supplies from SFPUC will decrease, SCVWD will be able to increase available supplies as required to meet demands. Subsequent to 2020, the quantity of supplies available from the District during multiply dry years will depend upon the development and expansion of the system occurring between now and 2020, as detailed in the District's IWRP 2003 Draft (SCVWD, 2005). An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence is provided in Table 5-1.

In the event of a decrease of local supplies, the SJMWS would respond by pursuing demand reduction programs in accordance with the severity of the supply shortage. Additionally, water transfers would be sought to help alleviate the supply shortfall if necessary. The supply deficit would be compensated for by increased conservation levels, additional transfers, or a combination of both.

Table 5-1. Minimum 3-Year Supply, Acre-Feet

Average 2005	Multiple Dry Water Years*		
	2006	2007	2008
SFPUC			
5,422	3,775	3,775	3,282
% of Normal	65.7%	62.2%	51.3%
SCVWD			
17,778	20,505	21,585	23,158
% of Normal	110.6%	111.9%	115.5%

III. STAGES OF ACTION

In the event of a water shortage, restrictions on potable water use will be enforced by the City according to the water shortage provisions included within Chapter 15.10 of the City's Municipal Code. Mandatory restrictions on potable water use would be applied to different shortage levels to reduce potable demand.

Description of Stages

Stage 1 10% Mandatory Program

- Irrigation of outdoor landscaping is prohibited during designated daylight hours, with certain exceptions

Stage 2 20% Mandatory Program

- Continue and intensify all activities undertaken during Stage 1
- Businesses are required to display "notice of water shortage" information
- No potable water may be used to clean any exterior paved or hard-surfaced area, or the exterior of any building or structure
- The operation of decorative fountains using potable water is restricted

Stage 3 30% Mandatory Program

- Continue and intensify all activities undertaken during Stages 1-2
- Irrigation of outdoor landscaping is prohibited at all times, with certain exceptions
- No new outdoor landscaping or plantings shall be installed during the months of May through October
- Public use of water from hydrants is prohibited

Stage 4 40% Mandatory Program

- Continue and intensify all activities undertaken in Stages 1-3
- All irrigation of outdoor landscaping is prohibited at all times
- Filling of any swimming pool, fountain or spa is prohibited

In the event of a 50% reduction in water supply, the SJMWS will enforce the 40% mandatory program and evaluate actual water consumption to determine what additional measures can be taken to further reduce potable water use. The City of San Jose will enforce any additional measures deemed appropriate for the situation in order to reduce water use. The City Council will determine priorities for use of available water within the SJMWS service areas. The SJMWS will work closely with SCVWD, SFPUC and other water retail agencies to implement any action stages during a period of water shortage.

IV. MANDATORY PROHIBITIONS ON WATER USE

The City Council has adopted several ordinances and resolutions to deal with drought, water waste, and instituted water use prohibitions. The following is a list of the Ordinances and Resolutions and dates adopted:

Resolution 60748	6/28/88	Ordinance 23113	4/18/89
Resolution 60749	6/28/88	Resolution 61292	4/18/89
Resolution 60950	11/25/88	Resolution 62045	3/27/90
Ordinance 23083	4/18/89	Resolution 62551	10/20/90
Ordinance 23109	4/18/89	Resolution 63593	3/24/92
Ordinance 23110	4/18/89	Ordinance 24600	4/26/94

Of note is Resolution 63593, which formally adopted the Water Shortage Contingency Plan, and Ordinance 24600, which updated Chapter 15 of the City of San Jose Municipal Code to add measures regarding water use during a period of water shortage.

V. CONSUMPTION LIMITS

Should SJMWS need to enforce the potable water use restrictions detailed in Chapter 15.10, customers may file an exception request, as detailed within said chapter. A customer may document the reasons why there is no other alternative to the use of potable water for the specified purpose, and why no other source of water, such as recycled water, can be used, and the City will review the request and may grant an exception to that customer.

VI. PENALTIES OR CHARGES FOR EXCESSIVE USE

The City of San Jose will enforce mandatory reduction programs as necessary to decrease consumption during a water shortage. Water use restrictions are contained within the City Municipal Code, and therefore SJMWS customers are required to comply with any measures the City determines the need to enforce. Customers that do not comply with the restrictions would be subject to citation from the City's Code Compliance inspectors. SJMWS currently has no additional charge for penalties or fees for excessive use during times of supply shortage. However, during a time of water shortage, SJMWS will evaluate the need for any penalties or fees, and the City Council may adopt additional penalties or charges as deemed appropriate.

VII. ANALYSIS OF REVENUE AND EXPENDITURE IMPACTS

The SJMWS's initial response to shortage is to use reserve funds. A large portion of the SJMWS's costs are not directly related to the quantity of water delivered. Examples of these costs include meter readers, billing staff, and pump and facilities maintenance. Expenses are increased during periods of drought by additional programs, staff time, and water purchase costs. Therefore, unit price increases must be implemented to offset the impacts of lower water sales and higher expenses. Finally, expenses such as capital improvements are deferred when feasible. Table 5-4 shows an example of the impacts of reduced demand and the resulting rate increases necessary to meet unchanged expenses.

It is currently unknown how expenses will actually vary during a water shortage. Due to the variable nature of costs associated with water wholesale purchase and costs related to operation of the distribution system, the increases in the water rate schedule to be charged during a water shortage will be determined during the time of an actual water shortage.

Table 5-2. Financial Impacts				
Water Revenue	Percent Reduction	AF Sold	HCF Sold	Unit Price $/HCF
$18,352,124	Normal 2004	21,436	9,337,373	$1.97
$18,352,124	25%	16,077	7,003,030	$2.62
$18,352,124	35%	13,933	6,069,292	$3.02
$18,352,124	50%	10,718	4,668,687	$3.93

Operation expenditures and water revenue will be evaluated to determine the appropriate unit increase in the rate schedule. SJMWS will evaluate the situation and recommend an increased rate schedule to be enforced during the shortage, and submit the schedule for approval by the City Council.

VIII. IMPLEMENTATION OF THE CONTINGENCY PLAN

The water shortage measures described in Chapter 15.10 of the City of San Jose Municipal Code may be enforced upon resolution of the City Council. The San Jose City Council may, by resolution, declare a state of water shortage whenever it finds that water supplies are expected to be inadequate to meet at least ninety percent of projected water demand, or whenever a minimum conservation level of ten percent or more has been established by the Santa Clara Valley Water District. In adopting such a resolution, the City Council may declare whether the water shortage is a ten, twenty, thirty, or forty percent shortage.

IX. WATER USE MONITORING PROCEDURES

During the 1987-1992 drought, SJMWS compiled water production on a daily basis. All sources were monitored, and a monthly report was submitted to the SJMWS Division Manager and the SCVWD. This process was found effective in keeping the SJMWS within its water allotment.

In the event of a Stage 1 or 2 water shortage, the SJMWS would use the above procedure. During a Stage 3 or 4 water shortage, water production figures would be reported to the Division Manager. Monthly reports would be sent to the Director of Environmental Services Department and the City Council.

X. DISASTER PREPAREDNESS/EMERGENCY RESPONSE PLAN

SJMWS's facilities have been designed to provide adequate supplies of water during normal and emergency operations. Reservoirs and emergency pump stations have been placed at elevations and locations, which will maintain supplies to customers during power failures. SJMWS staff is on duty 24 hours a day to respond to emergency situations. Engine-driven generators or pumps are installed to provide emergency supplies of water. SJMWS's facilities are designed such that water stored in reservoirs at the highest elevations may be drawn down to the lower pressure zones for emergency use.

Connections are maintained with adjacent water utilities to provide limited supplies in the event of an emergency. A connection to the San Jose Water Company is maintained at King Road and Tully Road for the Evergreen service area. A two-way connection to the City of Santa Clara is maintained at De La Cruz Boulevard and Seaboard Avenue for the North San Jose/Alviso area.

The SJMWS has developed an Emergency Response Plan, which includes appendices such as an Emergency Notification Plan, Public Notification Plan, Blackout Plan, and Disaster Operation Plan. A copy of the Disaster Operation Plan, most recently reviewed and revised in April 2005, has been included in Appendix I.

6
Recycled Water

I. INTRODUCTION

The City of San Jose began implementing a major water recycling program, known as South Bay Water Recycling (SBWR), under the auspices of the San Jose/Santa Clara Water Pollution Control Plant's (Plant) National Pollutant Discharge Elimination System Permit (NPDES Permit). The program was developed to protect the salt marsh habitat of two federally protected endangered species, the salt marsh harvest mouse and the California clapper rail, by reducing effluent flows from the Plant into the wetlands of the South Bay. A further benefit of this program was the development of a drought-proof supply of water, which augments local and imported water supplies.

The SBWR program delivers disinfected tertiary treated wastewater from the Plant through an extensive recycled water distribution system consisting of over 105 miles of pipeline. The recycled water is used for non-potable purposes such as agriculture, industrial cooling and processing, and irrigation of golf courses, parks, and schools. During the peak summer season, SBWR diverts between 10 and 16 million gallons of recycled water per day for irrigation and industrial uses to over 500 customers throughout San Jose, Santa Clara, and Milpitas. In 2004, approximately 2,276 million gallons of treated wastewater was recycled through the SBWR system.

II. WASTEWATER COLLECTION AND TREATMENT

Wastewater from the SJMWS service areas is collected and treated at the San Jose/Santa Clara Water Pollution Control Plant located at the south end of San Francisco Bay, which has a design capacity of 167 million gallons per day (mgd). The average annual Plant influent for 2004 was approximately 114 mgd and it is expected to increase to approximately 147 mgd by 2030 (see Table 6-1). In addition to the SJMWS service areas, the Plant treats wastewater from San Jose, Santa Clara, Milpitas, Campbell, Cupertino, Los Gatos, Monte Sereno and Saratoga, serving an area of over 300 square miles and a population of more than 1.3 million.

Wastewater is treated by the Plant to tertiary levels, and discharged through Artesian Slough and into the South San Francisco Bay. About 10% of the final treated water is diverted through the SBWR system (Figure 6-1). The SBWR system is part of an effort to maintain wastewater discharge below a level of 120 mgd. Expansion of the recycled water system will be an important part of the effort to prevent additional development related flows from adversely impacting the salt marsh.

Table 6-1. San Jose/Santa Clara Water Pollution Control Plant Flow Projections (mgd)

	2005	2010	2015	2020	2025	2030
Plant Influent	120	122	127	134	140	147
Recycled through SBWR	7	9	12	15	18	21
Plant Effluent	110	109	111	115	118	122
Percent Diverted	6%	8%	11%	13%	15%	17%

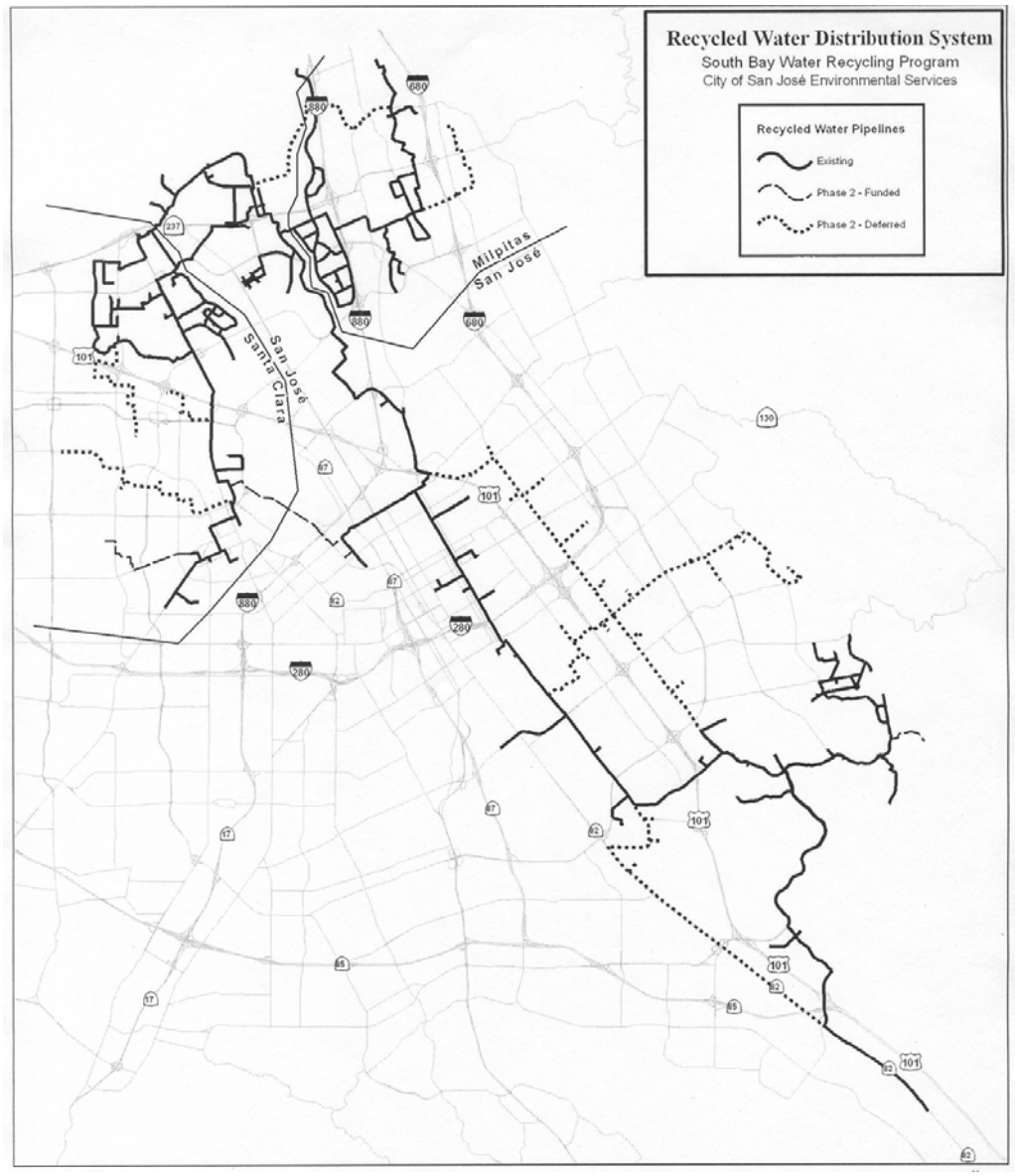


Figure 6-1. SBWR service area-wide pipeline extensions.

III. RECYCLED WATER USES

Within the SJMWS service area, there were 145 recycled water customer accounts as of the end of 2004. Typical uses of recycled water include landscape irrigation, median and streetscape irrigation, cooling towers, paper manufacturing, power generation, dual plumbing water closet use.

The total number of customer accounts and recycled water usage has increased steadily since 1999 (see Table 6-2). A notable exception to the steady usage increase occurred in late 2004/early 2005, when two new power plants came online as recycled water users, increasing recycled water usage by approximately 2 mgd throughout most of the year (not reflected in Table 6-2). The two general types of recycled water uses within the SJMWS service area are

Table 6-2. Historical Recycled Water Use by Service Area						
Service Area	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**
NSJ/Alviso	435	409	407	466	657	610
Evergreen	481	975	1,380	1,254	1,306	1,723
Edenvale	0	0	0	0	0	0
Coyote	0	0	0	0	0	0
Total Usage (af/yr)	**916**	**1,384**	**1,787**	**1,721**	**1,963**	**2,333**
No. of Accounts	32	61	94	110	141	145

irrigation/agricultural and industrial, with each currently accounting for approximately half of the total use. It is anticipated that the projected breakdown of water use types will remain relatively constant as usage increases, with no significant new uses (wildlife habitat, wetlands, streamflow augmentation, etc.) in the immediate future.

We are currently unable to make a comparison of 2005 projected use figures to actual use figures, as projections for the SJMWS service area were not included in the 2000 report. Because the SBWR program has greatly developed in recent years, it is now feasible to include projections of usage within the service area. SJMWS communicated with several local agencies to coordinate recycled water information, including the City-operated wastewater treatment plant.

IV. FUTURE RECYCLED WATER USE

There are three major areas of new development planned which will require a substantial increase in the amount of recycled water delivered within the SJMWS service area (see Table 6-3). An increase in recycled water usage is planned for the City's "Vision North San Jose" development project along North First Street. The Water Supply Assessment for the project estimates an ultimate recycled water increase of approximately 4,100 af within the North San Jose/Alviso service area. An increase is also projected for the "Evergreen East Hills Visioning Strategy," which addresses new development within the Evergreen service area. The preliminary Water Supply Assessment for this project estimates an increase of 510 af of recycled water. The use of recycled water is required as both a water supply source in order to meet all demands associated with these development projects, and as a sewer flow diversion measure. Additional distribution facilities will be funded by developers as required to expand the system to meet their water supply and flow diversion needs.

Additionally, SCVWD estimates approximately 5,600 af of recycled water will ultimately be utilized within the Coyote Valley/South County area. SCVWD is currently planned to be the wholesaler responsible for providing recycled water to this area.

Table 6-3. Recycled Water Use Projections for SJMWS Service Areas (af/yr)						
	2005	**2010**	**2015**	**2020**	**2025**	**2030**
SJMWS	3,000	3,500	5,900	8,400	10,800	13,200

As previously stated, approximately half of the recycled water delivered within the SJMWS service area is for irrigation/agricultural purposes. Therefore, the actual use of recycled water

during any given year is correlated with the weather and rainfall during that year. During wet years, actual recycled water usage will likely be less than anticipated, as less water is needed for irrigation.

SBWR will continue to actively participate in the Bay Area Regional Water Recycling Program (BARWRP). This jointly sponsored program includes the U.S. Bureau of Reclamation, California Department of Water Resources, and 17 Bay-Area water and wastewater agencies, and has examined potential near-term and long-term uses of recycled water throughout the San Francisco Bay Area. Categories of potential SBWR recycled use were identified for further investigation:

- Full development of a non-potable recycled water system serving urban customers throughout the SBWR service area (defined as the service area of wastewater agencies tributary to the WPCP)

- Export recycled water to distant large non-potable markets

- Indirect potable reuse (e.g., groundwater recharge), and

- Use of recycled water for environmental enhancement (wetlands, wildlife habitat, streamflow augmentation).

As growth continues in the Bay Area, SBWR will investigate these long-term options in close cooperation with Santa Clara Valley Water District.

V. OPTIMIZATION AND ACTIONS USED TO ENCOURAGE RECYCLED WATER USE

Currently, the cities of San Jose, Santa Clara and Milpitas promote recycled water usage through a variety of mechanisms, including:

- Lower cost of recycled water than potable water
- SBWR may contribute toward construction costs to retrofit an existing site to receive recycled water
- SBWR obtains regulatory approval for recycled water usage
- The cities of San Jose, Santa Clara, and Milpitas have ordinances requiring the use of recycled water for irrigation where available.
- City of San Jose prohibits the use of potable water for uses appropriate to recycled water.
- Public education through school curriculum, site supervisor training, marketing to potential customers and outreach at conventions, events, etc.
- SBWR participates in the Bay Area Regional Water Recycling Program (BARWRP), a regional recycled water planning effort.
- Expansion of system to areas where recycled water is unavailable and adding reliability to system.
- Pioneering new uses of recycled water, (i.e. printed circuit boards, paper manufacturing, streamflow augmentation, etc.)
- SCVWD is evaluating the possibility of additional treatment of water supplies to appeal to a greater variety of recycled water uses.

Throughout San Jose, the system will continue to expand as additional distribution facilities are constructed by developers as needed to supply recycled water to fulfill their water and sewer flow diversion needs. Due to the many variables involved in recycled water uses and the

possible applications of these optimization measures, it is unclear how each individual mechanism can be quantified.

Table 6-4 summarizes the actions used to encourage recycled water use.

Table 6-4. Actions Used by SBWR to Encourage Recycled Water Use *

Methods	Check if Used
Subsidized costs	X
Grants	X
Dual Plumbing Standards	
Regulatory Relief	X
Regional Planning	X
Incentive Program	X
Long-Term Contracts (Price/Reliability)	
Rate Discounts	X
Prohibit specific fresh water uses	X
Low-interest loans	X
Public education/information	X
Require recycled water use	X

*These actions are subsidized through Sewer Service and Use Funds.